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Relocation of *Impatiens anaimudica* C. E.C. Fisch. (Balsaminaceae) and the taxonomic status of *I. konalarensis* Chandrab. *et al.*

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Abstract

Impatiens anaimudica C.E.C. Fisch., described based on the collection of Barnes made in 1933 from the western side of High Ranges in Kerala and variously categorised as "endangered" or "possibly extinct" is relocated from the type locality. *I. konalarensis* Chandrab. *et al.*, described from the eastern side of High Ranges is found to be conspecific and hence reduced to a synonym of *I. anaimudica*. A detailed description, an illustration and relevant notes are provided.

INTRODUCTION

The genus *Impatiens* L. with about 900 species is mainly distributed in tropical Africa and South East Asia with a few representatives in North America, Europe and East Asia (Grey-Wilson, 1985). In India the genus is represented by about 203 species in two major centres of distribution, the Western Ghats and the Himalayas (Vivekananthan *et al.*, 1997). Of the 86 species reported from the Western Ghats, 76 are endemic, and 67 are reported to be occurring in Kerala (Jomy Augustine *et al.*, 1999). The Western Ghats is the richest phytogeographical area of *Impatiens* in the Indian subcontinent and perhaps in the world (Bhaskar, 1981).

C.E.C. Fischer (1935) described *Impatiens anaimudica* based on the collection of E. Barnes made in 1933 from 'Anaimudi Ridge' of Eravikulam National Park. After the type collections this species was not collected and Nayar and Sastry (1988) categorised it as 'endangered' or 'possibly extinct'. Whereas, Shetty and Vivekananthan (1991) assigned 'indeterminate' category and mentioned that it could not be located after the first collection by E. Barnes. More over, they also mentioned that 'type' was available at MH. But the type specimen could not be located at MH as rightly stated by Henry *et al.* (1979). While describing this species Fischer cited six materials and all are in Kew ('*E. Barnes 582* - type, *579, 580, 581, 583, 811*'). A photograph of the type is available at CAL. During a field trip carried out in 1999 in connection with the floristic research project of Eravikulam National Park, a herbaceous species of *Impatiens* could be found on the way to Poovar (near to Indira Gandhi National Park). This on critical study, was found to be a perfect match with the type of *I. anaimudica* Fischer for its unique scarlet-red spurless flower which is very characteristic.

Chandrabose, Chandrasekaran and Nair (1984) described *I. konalarensis* based on a collection from Konalar, about 30 km away from the type locality of *I. anaimudica*. They compared their material with *I. elegans* Bedd. instead of the more closely allied species *I. travancorica* Bedd. and *I. anaimudica* C.E.C. Fisch. *Impatiens anaimudica* is fairly common in the Eravikulam National Park of Kerala and adjoining areas of Tamil Nadu. A casual observation of authentic herbarium specimens of the two species - *I. anaimudica* and *I. konalarensis* - has revealed their similarities in morphology. For confirmation of the correct identity of these two species, the type specimens of *I. konalarensis* (*Chandrabose 69013*: holotype – CAL; *Chandrabose 69013c-d*: paratypes – MH) and *I. anaimudica* (*E. Barnes 582*, K) were examined. The protologue and illustration of *I. konalarensis* perfectly matched with that of *I. anaimudica*. Fischer (1935) described the seeds of *I. anaimudica* as with "papillae" and Chandrabose *et al.* (1984) described those of *I. konalarensis* as "... tubercled, glabrous." However, the illustration in the original publication showed the seed with 'some sorts of projections' (Chandrabose *et al.*, 1984). But the study of the seeds of *I. konalarensis* (*Chandrabose 69013c*: paratype - MH) showed that the seeds had finger like papillae as in *I. anaimudica*.

The detailed study of the seeds from the type specimens of the two species and that of the present collection revealed that seeds of all the three possessed same morphology though they were differently described by the different authors. Therefore, *I. konalarensis*, beyond doubt, is considered as conspecific to *I. anaimudica*.

A detailed description and illustrations based on recent collections are provided for easy identification.

Impatiens anaimudica C.E.C. Fisch., Bull. Misc. Inform. 1935: 92-93 & in Gamble, Fl. Pres. Madras: 1871. 1936; Vivekananthan *et al.*, Flora India 4: 117-118. 1997. (Fig. 1).
Type: India, Travancore (=Kerala), Anaimudi Ridge, 8000 ft., *E. Barnes 582* (K, photograph!).

Impatiens konalarensis Chandrabose, Chandrasekaran & Nair, *J. Bombay Nat. Hist. Soc.* 81: 676-677. 1984 (**syn. nov.**).
Type: India, Tamil Nadu, Konalar, *Chandrabose 69013 a* (CAL-holotype); *Ibid.,Chandrabose 69013 b-h* (MH- paratypes).

Herbs, up to 80 cm high. Stem terete, slightly swollen at nodes, slender, erect or prostrate, reddish-green, glabrous, young parts pilose, rooting at nodes. Leaves alternate, broadly ovate to elliptic ovate, 20-45 x 14-40 mm, subtruncate at base, acute to subacute at apex, membranous, early deciduous from the lower parts of the stem, dark green above, pale green beneath, lateral veins 6-7 pairs, sparsely pilose along midrib and secondary veins below, margins crenate to serrate, each serration ending in a cilia or teeth; petiole slender, up to 45 mm long, often reddish-green, glabrous to sparsely pilose. Flowers axillary, 3-4 in number, 15 mm. across, scarlet-red; pedicel very slender, 23-40 mm long, sparsely pubescent; bracts 4.1-4.2 x 2.4-2.5 mm, ovate-lanceolate, acute to slightly acuminate, glabrous; sepals 3: lateral sepals 2, ovate to ovate-elliptic, 4.9-5.8 x 2.3-2.6 mm, acute to acuminate, glabrous; posterior sepals ovate to elliptic, 7-7.8 x 4.8-5.2 mm, concave, acuminate, glabrous, finely streaked with

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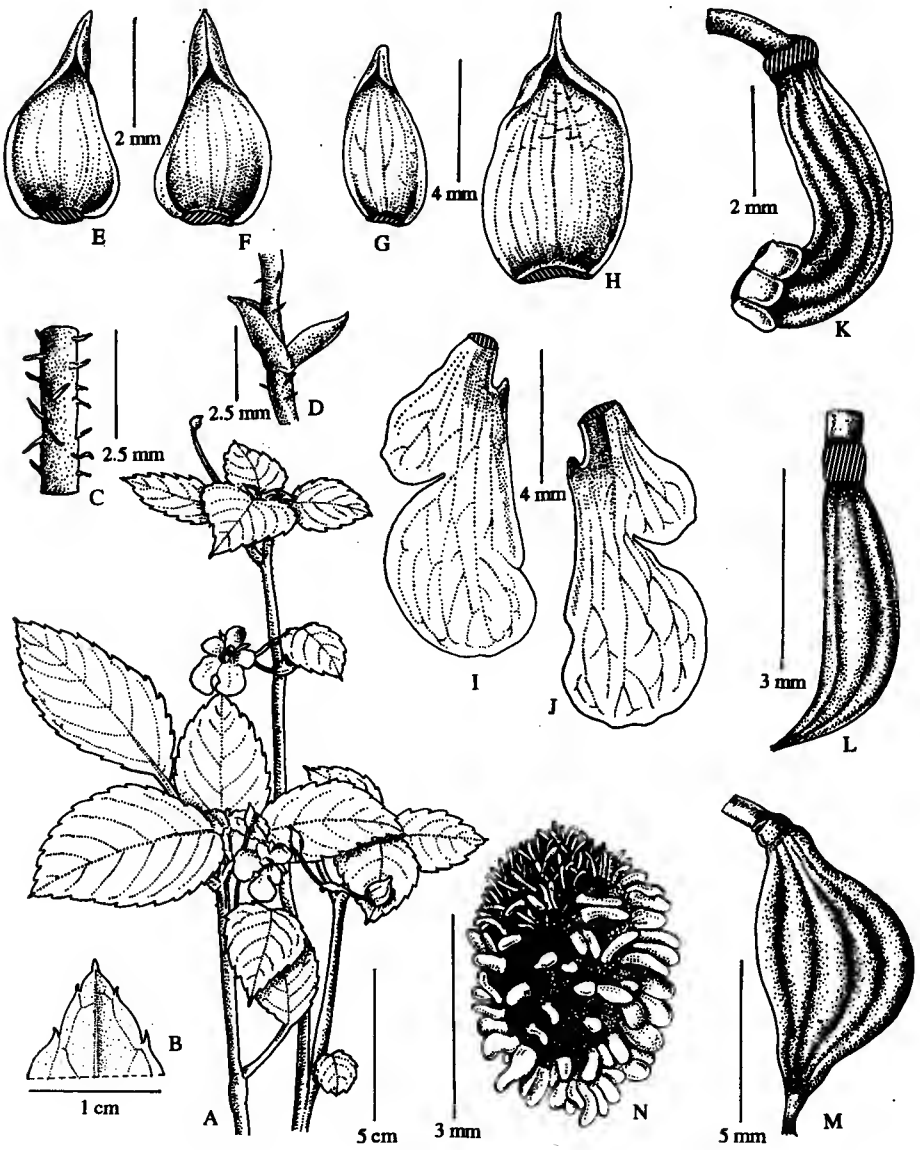

Fig. 1. *Impatiens anaimudica* C.E.C. Fisch.: A. Flowering and fruiting twigs; B. Leaf tip showing serrate margin and acuminate apex; C. Small portion of young stem showing pilose nature; D. Bracts; E & F. Lateral sepals (ventral side); G. Posterior sepal (ventral side); H. Standard petal (ventral side); I & J. Wing petals; K. Column with anthers; L. Pistil; M. Capsule; N. Seed.

crimson on a lighter background, spur absent or reduced to a small rounded projection at the base; petals 3: standard petal ovate, 0.9-1.1 x 0.5-0.6 cm, apically acuminate, deeply concave, glabrous; wing petals 2, crimson-red, glabrous, bi-lobed, upper lobe ovate to oblong, 4.8-5 x 2-25 mm, apically obtuse to acute, lower lobe obovate to subrotund, 9-10 x 5-6 mm, apically rounded; column 6-6.8 mm long, slightly curved; anthers 5, basifixed, ± 1 mm long, cohering; filaments up to 5.5 mm long, free at base, slightly connate at apex, yellowish; ovary ovate-elliptic, 5-6 x 11-12 mm, apically acute to slightly acuminate, glabrous, 5-celled; stigma sessile, 5-toothed. Fruits capsular, obliquely ellipsoid, 8-9 x 4-5 mm, beaked, glabrous; seeds solitary, rarely two, 4.8-5 x 3-3.7 mm, subglobose, clothed with irregular finger-like cylindrical and flattened papillae.

Flowering and fruiting: June – December.

Distribution: Endemic to southern Western Ghats, found only in the states of Kerala and Tamil Nadu.

Ecology: This species grows on high altitude plateaus near moist shady places of the shola fringes and stream banks, generally above 1900 m.

Specimens examined: INDIA, **Kerala**: Eravikulam National Park, on the way to Earvikulam hut, 1998, *Biju 32321* (TBGT); Eravikulam National Park, Poovar, 1999, *Biju 32321, Biju 35868* (TBGT); *Ibid.*, 1999, *Biju 35647* (TBGT); **Tamil Nadu**: Konalar, 1980, *Chandrabose 69013a* (CAL, holotype of *Impatiens konalarensis*); *Chandrabose 69013c, 69013d* (MH, paratypes of *I. konalarensis*).

Notes: Barnes (1939) counted seeds of *Impatiens anaimudica* in each capsule from the type material and reported "two capsules contained 55 and 67 seeds". But in the original description by Fischer (1934) it was stated as "seeds few, often solitary". Fischer's description perfectly matched with that of the present collections (*Biju 32321, 35868*) and believe that Barnes (1939) count could be an error. In general, having more than 20 seeds in a capsule is quite unusual in high altitude *Impatiens*, especially in a herbaceous species like *Impatiens anaimudica*.

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